

Name: \_\_\_\_\_

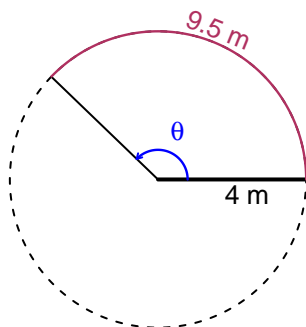
Date: \_\_\_\_\_

## Trig Final (TEST v620)

- You should have a calculator (like [Desmos](#)) and a [unit-circle](#) reference sheet.

### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The radius is 4 meters. The arc length is 9.5 meters. What is the angle measure in radians?

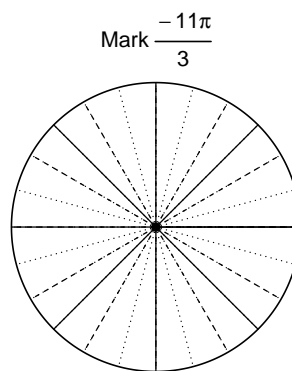


### Question 2

Consider angles  $\frac{13\pi}{4}$  and  $\frac{-11\pi}{3}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\sin\left(\frac{13\pi}{4}\right)$  and  $\cos\left(\frac{-11\pi}{3}\right)$  by using a unit circle (provided separately).



Find  $\sin(13\pi/4)$



Find  $\cos(-11\pi/3)$

**Question 3**

If  $\cos(\theta) = \frac{39}{89}$ , and  $\theta$  is in quadrant IV, determine an exact value for  $\tan(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with an amplitude of 7.59 meters, a midline at  $y = 6.18$  meters, and a frequency of 8.67 Hz. At  $t = 0$ , the mass is at the midline and moving up. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).